

1 What is claimed is:

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- 3 1. An array device for use in analyzing molecular events between one or more
- 4 biomolecules and one or more analytes comprising:
- 5 a) a substrate having at least one surface;
- 6 b) one or more immobilization regions formed on said known regions of said
- 7 surface(s), wherein said immobilization regions are adapted for attaching
- 8 said biomolecules to said surface; and,
- 9 c) one or more border regions formed on said surface surrounding said
- 10 immobilization regions, said border region(s) having a first wettable state
- 11 and a selectively achievable second wettable state different from said first
- 12 wettable state.
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- 16 2 The array device of claim 1 further comprising one or more convertible functional
- 17 groups adapted for selectively converting between a first wettable form and a second
- 18 wettable form when activated by to impart upon said border regions said second
- 19 wettable state from said first wettable state.
- 20
- 21 3. The array device of claim 2, wherein said convertible functional groups are
- 22 activated by an activity selected from the group consisting of photocleavage, photo-
- 23 isomerization, catalytic-polymerization, and photoreaction activities.
- 24
- 25 4. The array device of claim 2, wherein said convertible functional groups further
- 26 comprise a first wettable state moiety attached to said surface through at least one of
- 27 said convertible functional groups, wherein said first wettable state moiety imparts

1 said first wettable state upon said border regions, and whereby removal of said first
2 wettable state moiety from said convertible functional groups causes said border
3 regions to attain said second wettable state.

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5 5. The array device of claim 2, wherein said first wettable state moiety is a dendrimer
6 or dendritic molecule.

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8 6. The array device of claim 1, wherein said immobilization regions further comprise
9 biomolecules immobilized within said immobilization regions.

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11 7. A method for making an array of one or more biomolecules for use in analyzing
12 molecular events between one or more of said biomolecules and one or more analytes
13 comprising:

14 i) providing the array device comprising:

15 a) a substrate having at least one surface;

16 b) one or more immobilization regions formed on said known regions of
17 said surface(s), wherein said immobilization regions are adapted for
18 attaching said biomolecules to said surface; and,

19 c) one or more border regions formed on said surface surrounding said
20 immobilization regions, said border region(s) having a first wettable
21 state and a selectively achievable second wettable state different from
22 said first wettable state;

23 ii) depositing a first liquid containing at least one of said biomolecules onto at
24 least one selected immobilization region such that said first liquid
25 deposited is maintained within said selected region in-part by said first
26 wettable state of at least one of said border regions;

- 1 iii) allowing at least one of said biomolecules contained in said deposited first
- 2 liquid to attach to said surface within said selected immobilization region;
- 3 iv) removing said first liquid from said selected immobilization region;
- 4 v) activating said border region(s) partly or wholly maintaining said first
- 5 liquid within said selected immobilization regions such that such border
- 6 regions partly or wholly maintaining said liquid within said selected
- 7 immobilization regions no longer are capable of maintaining said first
- 8 liquid, or a second liquid within said selected immobilization region.

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10 8. A method of carrying out a molecular reaction on a surface of an array comprising

11 the steps of:

- 12 i) providing said array device which comprises:
 - 13 a. a substrate having at least one surface;
 - 14 b. one or more reaction regions formed on said known regions of said
 - 15 surface(s), wherein said reaction regions are adapted for reacting
 - 16 molecules adjacent said surface; and,
 - 17 c. one or more border regions formed on said surface surrounding said
 - 18 reaction regions, said border region(s) having a first wettable state
 - 19 and a selectively achievable second wettable state different from
 - 20 said first wettable state;
- 21 ii) depositing a first liquid containing at least one of said molecules onto at
- 22 least one selected reaction region such that said first liquid deposited is
- 23 maintained within said selected reaction region in-part by said first
- 24 wettable state of at least one of said border regions;
- 25 iii) allowing at least one of said biomolecules contained in said deposited
- 26 first liquid to contact said surface within said selected reaction regions;
- 27 iv) removing said first liquid from said selected reaction regions;

- 1 v) activating said border region(s) partly or wholly maintaining said first
2 liquid within said selected reaction regions such that said border regions
3 partly or wholly maintaining said liquid within said selected reaction
4 regions no longer are capable of maintaining said first liquid, or a
5 second liquid within said selected reaction regions.
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